



Exact Solutions > Functional Equations > Nonlinear Functional Equations with Several Independent Variables > Power-Law Cauchy Equation

2.  $f(xy) = f(x)f(y)$ .

**Power-law Cauchy equation.**

Solution:

$$f(x) = x^C,$$

where  $C$  is an arbitrary constant. Furthermore, the function  $f(x) \equiv 0$  is also a solution.

### References

- Fikhtengol'ts, G. M.**, *A Course of Differential and Integral Calculus, Vol. 1* [in Russian], Nauka, Moscow, 1969 (page 160).  
**Aczél, J. and Dhombres, J.**, *Functional Equations in Several Variables*, Cambridge Univ. Press, Cambridge, 1989.  
**Polyanin, A. D. and Manzhirov, A. V.**, *Handbook of Integral Equations: Exact Solutions (Supplement. Some Functional Equations)* [in Russian], Faktorial, Moscow, 1998.

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